FLOOD PROOFING – STATE OWNED BUILDINGS

FIELD DATA SUMMARY SHEET

Building No.: 06025 (Old No. 5004)
133 State Street
Location: Montpelier Complex

100-Year Flood Elev. 524.5

Total No. of Floors: 5
Floors including basement - 6
Gross Floor Area: 103,160 sq ft
Rentable Area: 76,679 sq ft
Lowest Level Floor Elev. 506.4
First Floor Level Elev. 530.1

Type of Structure: The interior of this building is being completely remodeled. Basement walls and floors are constructed of concrete. The basement floor is multiple level. There is a tunnel that connects this building and the Building at 135 State Street. The tunnel elevation is +/-506.4.

Primary Area Usage:

OFFICE SPACE is the primary usage of all floors except the basement floor. Basement floor is under renovation. All the mechanical rooms appear to have been reconstructed and are located on the basement floor. The basement floor has different elevation levels ranging from +/- 506 to 516.

There are a number of new mechanical rooms on the basement floor. There are large AC units and control panels, large amounts of piping and pumps and control panels for the central stream heating system that heats the majority of the State buildings, and a large number of electrical panels and transformers. Some of the equipment is located at the lowest elevation level of +/- 506.4.

The old kitchen that was reported to be located in the basement in the 1983 Flood Proofing Study is presently being removed. The new computer room is located on the first floor at elevation 530.1.

Primary Flood Damage:

Mechanical rooms:

- All Mechanical Rooms are located below the 100-year flood elevation 524.5.
- In the Mechanical Room with the new heating equipment there are a number of floor drains. Was not able to determine if this building had a sanitary lift station with check valve installed to prevent floodwaters from entering the building through the drain pipes.
- Large number of circulating pumps for heating system, mounted +/- 4 inches above floor.
- A number of condensate pumps are located on a 2 inch concrete pad on the basement floor.
- New large A/C chiller units and control panels on the basement floor.
- Fire alarm panels are mounted on the wall, +/- 8 inches above the floor.
- Large number of electrical panels and transformer located in the basement.

Plumbing, restrooms toilets and sinks located in basement.

Three elevators (traction type) provide access to basement, operating equipment located on roof. Potential damage to the sections of the elevators located in basement.

New emergency diesel generator (400 kw) and supporting equipment, electrical panels, switching panels and fuel tank are located in the basement. The generator air intake and exhaust is provided through an old wall section (There is standing water in the intake and exhaust section.) that is tied to a grated intake in the parking lot behind the building. Generator is mounted on skids 16 inches above the basement floor. It appears all conduits have been run from above and no conduits come from underground, which reduces floodwaters access locations. The average ground in the vicinity of the intake structure in the parking lot behind the building appears to be +/- 3 feet higher than the average ground in the front of the building, which is above the 100-year flood elevation.

There are a large number of A/C units mounted in the back of the building on concrete pads near ground level. These units are older, it was not known whether these units are being replaced by the new equipment on the basement floor. The ground level at the back of the building is 2 to 3 feet higher than the front of the building. This area maybe above the 100-year elevation, there is no elevation data at the back of the building.

Potential Methods for Damage Reduction:

Based on the 100-year flood elevation depicted in the photograph of this building the 100-year flood depth at the front of the building is 1.5 to 2.0 feet. See photograph below.

Electrical distribution panels, switch panels, service connections, wall penetrations below the 100-year flood elevation protect from water infiltration or elevate above 100-year flood elevation.

HVAC equipment below the 100-year flood elevation protect from water infiltration or elevate above 100-year flood elevation.

Plumbing wall penetrations, water heaters, toilets, sinks, floor drains, and shower drains below 100-year flood elevation protect from water infiltration or elevate above 100-year flood elevation. Typically toilets, sinks and floor drains below the 100-year elevation require back-flow valve installations. If back-flow prevention is not practical, all restrooms, sinks, toilets could be moved to the first floor above the 100-year flood elevation.

Wall penetrations below the 100-year elevation should be minimized, if possible design building wall penetrations to enter the building above the 100-year elevation. Designing wall penetrations to enter building above the 100-year elevation must also consider the Vermont winter temperatures and frost depths.

Dry-floodproofing this building or individual rooms may not be practical; the difference between the 100-year flood elevation and the basement floor is 18.1 feet. Typically the rule of thumb for dry-floodproofing is only used for flood depths less than three feet (36 inches). Dry-floodproofing old existing buildings may be technically feasible, however sealing the walls and floors of older buildings have a high probability of failure due to unforeseen factors. Since the 100-year flood depth at the front of the building is 1.5 to 2.0 feet above average ground and the building is being remodeled consideration should be given to sealing all wall penetrations, all cracks in the concrete walls and floors sealed, the exterior windows can be designed to be

watertight, all new piping should enter the building above the 100-year elevation these techniques can significantly reduce the potential for floodwaters from entering this building.

Another option would be to seal the building as much as possible (below the 100-year elevation), reduce areas where large amounts of water can enter the building (windows and doors). The interior basement floor and walls should be designed of flood-resident material (An example of a flooring material that should not be used in a basement below the 100-year elevation is carpet.), install a number of sump pumps at low points to remove water from the building (discharging to appropriate locations) reducing the floodwater depths in the building which in turn reduces flood damages. The power supply to the sump pumps would need to be elevated above the 100-year flood. .

There may be a potential to redesign the exterior ground levels around the building to reduce the flood damages to the building from the 100-year flood levels.

Montpelier Complex – 133 State Street